



RP2040 Basic Support IOVDD IOVDD USB_VDD supplies USB PHY, nominal 3v3. If IOVDD is 3v3, can share supply. In fact, in this and many applications, IOVDD, USB_VDD and ADC_AVDD are all powered directly from a single 3v3 supply, with the 1v1 digital core being handle by on-board regulator. Logic supply, nominally 3v3. BOOT_MODED QSPI_SS When held low on powerup, flash DVDD SS determines boot mode VREG_VOUT: Int core regulator, 1.1V Can supply DVDD Place 1uF in/out C27 (HIGH = flash boot, LOW = USBdevice) GND 1uF 1v1 bypass near pin. R13 10k RUN J6 Short to hold in reset RUN GPI00 3 → GPI01 async reset GPI02 4 → GPI02 USB_D+♦-USB_D USB_DM USB_DM GPI03 6 → GPI04 GPI05 7 → GPI05 GPI06 8 → GPI06 QSPI_SS 56 QSPI_SS GP107 9 → GP107 GPI08 11 → GPI08 QSPI_SD0 53 QSPI_SD0 GPI09 12 → GPI09 QSPI_SD1 55 QSPI_SD2 54 QSPI_SD2 54 QSPI_SD2 GPI010 GPI011 13 → GPI010 GPI011 45 → GPI011 QSPI_SD3 51 QSPI_CLK 52 QSPI_SCLK GPI011 → GPI011 → GPI012 GPI013 16 → GPI013 GPI013 GPI014 GPI015 GPI016 → GPI016 GPI016 → GPI016 WE 830108206909: CFPX-180 model 10 ppm tol, 20ppm stab GPI016 28 → GPI017 CL 8pF GPI017 29 → GPI018 XIN GPI019 30 → GPI019 GPI019 31 → GPI020 GPI021 32 → GPI021 12,0MHz 1k xout 21 XOUT GPI021 GPI022 34 → GPI022 GND C30 GPI022 GPI023 → GPI023 GPI024 36 → GPI024 Rule of thumb 6pFC1, C2 = 2 * CL - 2 * Cstray GPI025 37 → GPI025 SWCLKD—24 SWDIO > 25 SWD Using a stray cap of 5pF, gives GPI026_ADC0 GPI027_ADC1 GPI028_ADC2 40 GPI028/AD2 Into: CL = (C1 * C2) / (C1 + C2) + Cstray These Cn = 6p give CL = 8pF -- just what we need. 19 TESTEN GPI029_ADC3 41 \$\ightarrow\$ GPI029/AD3 GND mode: GND U5 RP2040 GND

Flash	00 00 00 00 00 00 00 00 00 00 00 00 00	Supply bypass, place near 1, 10, 22, 33, 42, 49	
Note: SS pulled-up externally, from bootmode switch	100nf 2 0 0 2 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	C32 C33 C34 100nF 100nF	Supply bypass, near 23, 50
QSPI_SS _1 CS	DI(100) 5 QSPI_SD0 D0(101) 2 QSPI_SD1	GND GND GND C37	C35
QSPI_CLK _6 CLK	S 103 / QSPI_SDS	GND GND GND	GND GND
	W25Q32JVSS Quad SPI requires QE bit in status register—2 to be set. In this case, WP becomes IO2 and HOLD becomes IO3.		

	Function								
GPIO	F1	F2	F3	F4	F5	F6	F7	F8	F9
0	SPI0 RX	UARTO TX	I2C0 SDA	PWM0 A	SIO	PI00	PIO1		USB OVCUR DET
1	SPI0 CSn	UARTO RX	I2C0 SCL	PWM0 B	SIO	PI00	PIO1		USB VBUS DET
2	SPI0 SCK	UARTO CTS	I2C1 SDA	PWM1 A	SIO	PI00	PIO1		USB VBUS EN
3	SPI0 TX	UARTO RTS	I2C1 SCL	PWM1 B	SIO	PIO0	PIO1		USB OVCUR DET
4	SPI0 RX	UART1 TX	I2C0 SDA	PWM2 A	SIO	PIO0	PIO1		USB VBUS DET
5	SPI0 CSn	UART1 RX	I2C0 SCL	PWM2 B	SIO	PIO0	PIO1		USB VBUS EN
6	SPI0 SCK	UART1 CTS	I2C1 SDA	PWM3 A	SIO	PIO0	PIO1		USB OVCUR DET
7	SPI0 TX	UART1 RTS	I2C1 SCL	PWM3 B	SIO	PIO0	PIO1		USB VBUS DET
8	SPI1 RX	UART1 TX	I2C0 SDA	PWM4 A	SIO	PIO0	PIO1		USB VBUS EN
9	SPI1 CSn	UART1 RX	I2C0 SCL	PWM4 B	SIO	PIO0	PIO1		USB OVCUR DET
10	SPI1 SCK	UART1 CTS	I2C1 SDA	PWM5 A	SIO	PIO0	PIO1		USB VBUS DET
11	SPI1 TX	UART1 RTS	I2C1 SCL	PWM5 B	SIO	PIO0	PIO1		USB VBUS EN
12	SPI1 RX	UARTO TX	I2C0 SDA	PWM6 A	SIO	PIO0	PIO1		USB OVCUR DET
13	SPI1 CSn	UARTO RX	I2C0 SCL	PWM6 B	SIO	PI00	PIO1		USB VBUS DET
14	SPI1 SCK	UARTO CTS	I2C1 SDA	PWM7 A	SIO	PI00	PIO1		USB VBUS EN
15	SPI1 TX	UARTO RTS	I2C1 SCL	PWM7 B	SIO	PI00	PIO1		USB OVCUR DET
16	SPI0 RX	UARTO TX	I2C0 SDA	PWM0 A	SIO	PIO0	PIO1		USB VBUS DET
17	SPI0 CSn	UARTO RX	I2C0 SCL	PWM0 B	SIO	PIO0	PIO1		USB VBUS EN
18	SPI0 SCK	UARTO CTS	I2C1 SDA	PWM1 A	SIO	PIO0	PIO1		USB OVCUR DET
19	SPI0 TX	UARTO RTS	I2C1 SCL	PWM1 B	SIO	PIO0	PIO1		USB VBUS DET
20	SPI0 RX	UART1 TX	I2C0 SDA	PWM2 A	SIO	PIO0	PIO1	CLOCK GPIN0	USB VBUS EN
21	SPI0 CSn	UART1 RX	I2C0 SCL	PWM2 B	SIO	PIO0	PIO1	CLOCK GPOUTO	USB OVCUR DET
22	SPI0 SCK	UART1 CTS	I2C1 SDA	PWM3 A	SIO	PI00	PIO1	CLOCK GPIN1	USB VBUS DET
23	SPI0 TX	UART1 RTS	I2C1 SCL	PWM3 B	SIO	PIO0	PIO1	CLOCK GPOUT1	USB VBUS EN
24	SPI1 RX	UART1 TX	I2C0 SDA	PWM4 A	SIO	PIO0	PIO1	CLOCK GPOUT2	USB OVCUR DET
25	SPI1 CSn	UART1 RX	I2C0 SCL	PWM4 B	SIO	PI00	PIO1	CLOCK GPOUT3	USB VBUS DET
26	SPI1 SCK	UART1 CTS	I2C1 SDA	PWM5 A	SIO	PI00	PIO1		USB VBUS EN
27	SPI1 TX	UART1 RTS	I2C1 SCL	PWM5 B	SIO	PI00	PIO1		USB OVCUR DET
28	SPI1 RX	UARTO TX	I2C0 SDA	PWM6 A	SIO	PI00	PIO1		USB VBUS DET
29	SPI1 CSn	UARTO RX	I2C0 SCL	PWM6 B	SIO	PI00	PIO1		USB VBUS EN

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Psychogenic Technologies

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Title: Tiny	Tapeout	4/5	Demo	Board
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